What is claimed is:

1.   A parallel arithmetic apparatus comprising a plurality of pairs of recording means for recording arithmetical elements to be operated and operating means for performing sum-of-products operations based

5   on the arithmetical elements recorded in said recording means, wherein one of said recording means of all pairs is selected and selecting means for inputting said arithmetical elements recorded in the selected recording means to the operating means of said pair is inserted between the recording means and operating means of any one pair.

10   2.   The parallel arithmetic apparatus according to claim 1, wherein temporary recording means for temporarily recording said arithmetical elements recorded in the recording means of a pair in which said selecting means is not inserted is inserted between the recording means and operating means of said pair, and

15   said selecting means is constructed in such a way as to input the arithmetical elements recorded in said temporary recording means to said operating means when the recording means of the pair in which said selecting means is not inserted is selected.

3.   The parallel arithmetic apparatus according to claim 1,

20   wherein said recording means of all pairs record, during a matrix operation, a first arithmetical element to be subjected to said matrix operation, and during a vector inner product operation, a second arithmetical element to be subjected to said inner product operation,

said selecting means is constructed, during said matrix operation,

25   in such a way as to input said first arithmetical element from the recording means of the own pair to the operating means of the own pair

and, during said inner product operation, in such a way as to select said recording means of all pairs one by one in a round-robin fashion and input said second arithmetical element from the selected recording means to the operating means of the own pair.

5   4.   The parallel arithmetic apparatus according to claim 1, wherein each of said operating means performs an operation with a content independently assigned to said pair using said arithmetical elements recorded in the recording means of said pair.

5.   The parallel arithmetic apparatus according to claim 4, 10   wherein said operation is an operation associated with any one of four-dimensional coordinate components.

6.   A parallel arithmetic apparatus that selectively performs a matrix operation and vector inner product operation, comprising:

a plurality of recording means for recording, during said matrix 15   operation, a first arithmetical element to be subjected to said matrix operation and recording, during said inner product operation, a second arithmetical element to be subjected to said inner product operation;

a plurality of operating means forming a one-to-one correspondence with said plurality of recording means for performing, 20   during said matrix operation, a sum-of-products operation by each operating means inputting said first arithmetical element recorded in the corresponding recording means, and performing, during said inner product operation, a sum-of-products operation by predetermined one of the operating means inputting said second arithmetical element recorded 25   in all the recording means; and

selecting means for selecting, during said matrix operation, the

recording means corresponding to said predetermined operating means and inputting a first arithmetical element recorded in this recording means in said predetermined operating means, and selecting, during said inner product operation, said plurality of recording means one by one in a

5   round-robin fashion and inputting a second arithmetical element recorded in the selected recording means in said predetermined operating means.

7.   The parallel arithmetic apparatus according to claim 6, wherein said arithmetical element is expressed with a floating point

10   number and said operating means is constructed so as to perform a sum-of-products operation of the floating point number.

8.   An entertainment apparatus that performs image processing on an entertainment image by performing a matrix operation with regard to coordinates expressing a position and shape of an object and

15   performing an inner product operation with regard to vectors used to express an image of said object, comprising:

a plurality of registers that records, during said matrix operation, a first arithmetical element subjected to said matrix operation and records, during said inner product operation, a second arithmetical

20   element subjected to said inner product operation;

a plurality of sum-of-products operators forming a one-to-one correspondence with said plurality of registers that performs, during said matrix operation, a sum-of-products operation by each sum-of-products operator inputting said first arithmetical element recorded in the

25   corresponding register, and performs, during said inner product operation, a sum-of-products operation by predetermined one of the

sum-of-products operators inputting said second arithmetical element recorded in all registers; and

a selector that selects, during said matrix operation, a register corresponding to said predetermined sum-of-products operator and

5   inputs a first arithmetical element recorded in this register in said predetermined sum-of-products operator, and selects, during said inner product operation, said plurality of registers one by one in a round-robin fashion and inputs a second arithmetical element recorded in the selected register in said predetermined sum-of-products operator.

10   9.   An entertainment apparatus that performs image processing on an entertainment image by carrying out a matrix operation between a matrix and coordinate values to perform a coordinate transformation of coordinates expressing the position and shape of an object and carrying out an inner product operation between a normal vector oriented in the

15   normal direction of the surface of said object and position vector of a light source to determine the display mode of the surface of said object, comprising:

a plurality of registers that records said coordinate values and component values corresponding to any one row of said matrix during

20   said matrix operation and records said normal vector and component values corresponding to any one component of said position vector during said inner product operation;

sum-of-products operators forming a one-to-one correspondence with said plurality of registers that carry out a sum-of-products operation

25   during said matrix operation by each sum-of-products operator inputting said coordinate values recorded in the corresponding register and

component values corresponding to said one row of said matrix, and carry out a sum-of-products operation during said inner product operation by predetermined one of the sum-of-products operators inputting said normal vector recorded in all registers and component

5 values of said position vector;

a selector that selects, during said matrix operation, a register corresponding to said predetermined sum-of-products operator and inputs said coordinate value recorded in this register and component values corresponding to said one row of said matrix to said

10 predetermined sum-of-products operator, and selects, during said inner product operation, said plurality of registers one by one in a round-robin fashion and inputs component values of said normal vector and said position vector recorded in the selected register in said predetermined sum-of-product operator.

15   10.   A processing method that allows a matrix operation and vector inner product operation to be selectively executed and is executed by an apparatus provided with a plurality of operating means, comprising the steps of:

inputting, during said matrix operation, arithmetical elements

20 subjected to said matrix operation by assigning the arithmetical elements to said plurality of operating means based on the features thereof to carry out a sum-of-products operation based on the assigned arithmetical elements; and

inputting, during said inner product operation, arithmetical

25 elements subjected to said inner product operation in one predetermined operating means to allow said operating means to carry out a

sum-of-products operation based on the arithmetical elements.

11. A computer program that that makes it possible to selectively execute a matrix operation and vector inner product operation and renders a computer provided with a plurality of operating means to

5 execute:

a step of inputting, during said matrix operation, arithmetical elements subjected to said matrix operation by assigning the arithmetical elements to said plurality of operating means based on the features thereof to carry out a sum-of-products operation based on the assigned

10 arithmetical elements; and

a step of inputting, during said inner product operation, arithmetical elements subjected to said inner product operation in one predetermined operating means to allow said operating means to carry out a sum-of-products operation based on the arithmetical elements.

15 12. A semiconductor device that makes it possible to selectively execute a matrix operation and vector inner product operation and is built in an apparatus incorporating a computer provided with a plurality of operating means, rendering said apparatus to execute:

a step of inputting, during said matrix operation, arithmetical

20 elements subjected to said matrix operation by assigning the arithmetical elements to said plurality of operating means based on the features thereof to allow each operating means to carry out a sum-of-products operation based on the assigned arithmetical elements; and

a step of inputting, during said inner product operation,

25 arithmetical elements subjected to said inner product operation in one predetermined operating means to allow said operating means to carry

out a sum-of-products operation based on the arithmetical elements.